

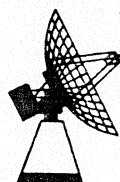
NEC

Authentic series

MODEL: K537E (SG)/(BG)

STEREO AMPLIFIER SERVICE MANUAL

ORDER No. 499-91-0229



Better Service
Better Reputation
Better Profit



SPECIFICATIONS

Track Format.....	4-Track, 2-channel stereo	Distortion	Less than 1.0%
Head Configuration.....	Permalloy/ferrite combination	(NORMAL TAPE)	
	Recording/Playback Head × 1	Input Impedance;	
	Erasing Head × 1	MIC.....	0.25 mV/10 k Ω
Motor	Servo controlled DC Motor × 1	LINE.....	60 mV/47 k Ω
	Capstan DC Motor × 2 (reel and take-up)	Output (load impedance):	
Wow & Flutter	Less than 0.04% WRMS	LINE.....	400 mV/47 k Ω
Fast Forward/Response:		HEADPHONE	65 mV/8 Ω
Normal (at -20 dB)	20 - 19,000 Hz	Power Supply.....	AC115/230V 50/60 Hz
CrO ₂ (at -20 dB).....	20 - 20,000 Hz	Power Consumption	24W
METAL (at -20 dB)	20 - 21,000 Hz	Dimensions	430(W)×110(H)×310(D) mm
Signal to Noise Ratio		Weight	6.8 kg
(METAL TAPE).....	57 dB (DOLBY NR OFF)		
	65 dB (DOLBY NR B-type)		
	72 dB (DOLBY NR C-type)		

Note: The above specifications are subject to change without notice for further improvement.

NEC Corporation

TOKYO, JAPAN

TABLE OF CONTENTS

1. OPERATION OF K537E	3
2. BLOCK DIAGRAM	11
3. ALIGNMENT PROCEDURE	12
4. PWB ASSY	15
5. SCHEMATIC DIAGRAM	19
6. WIRING DIAGRAM	23
7. EXPLODED VIEW	25
8. EXPLODED VIEW OF MECHANISM UNIT	26
9. REPLACEMENT PARTS LIST	27

OPERATION OF K537E

IMPORTANT ON POWER SUPPLY

For SG type

Your unit is factory preset for 230V. However every unit has a switch to select 115V (suitable for 110 – 120V) or 230V (suitable for 220 – 240V) to suit your local voltage. This can be easily done by changing the voltage selector dia. (See Fig. 1)

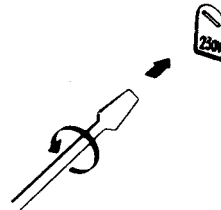


Fig. 1 For SG type

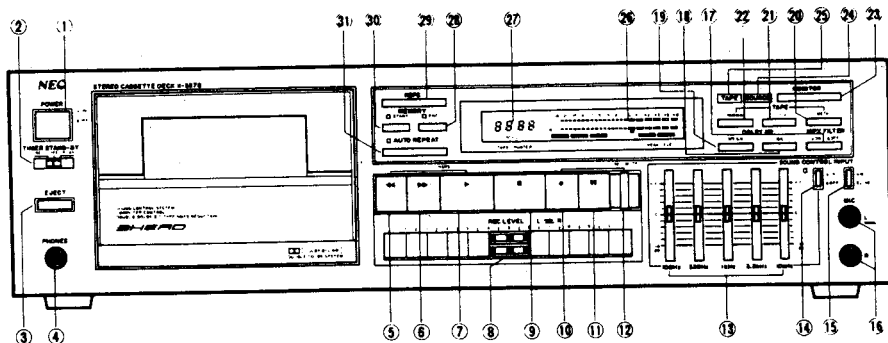


Fig. 2 Location of Controls and Indicators

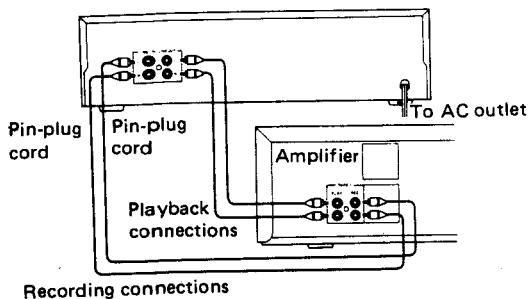


Fig. 3 Connection to an Amplifier

LOCATIONS AND FUNCTIONS OF PARTS (Fig. 2)

1. **POWER Switch**
Turns the power on and off.
2. **TIMER STANDBY**
For recording and playback with an accessory timer.
3. **EJECT Button**
Depress to open the cassette compartment.
Tape counter returns to zero and memory is reset.
4. **PHONES**
For connection with a stereo headphone to monitor recording or playback.
5. **REW Button**
Depress to rewind tape.
6. **FF(fast forward) Button**
Depress for rapid tape advantage.
7. **PLAY Button**
Depress to play back a tape.
8. **REC (Record) LEVEL Control Knob**
Slide lever to adjust recording signal level; the Peak Level Meter will indicate the power of reponse.
9. **STOP Button**
Depress to stop tape.
10. **REC (Record) Button**
Depress for recording. The REC button (red lamp) and PLAY button (green lamp) will illuminate simultaneously, and recording will start at the touch of the button.
11. **PAUSE Button**
Depress to stop the tape advance temporarily in both record and play modes; depress again to restart tape.
MODE INDICATOR LAMPS: When you press any mode button other than STOP, the respective indicator lamp glows to indicate the mode of operation.
12. **REC (Record) MUTE Button**
Automatically inserts a 4-second pause between selections or programs on a tape.
13. **SOUND CONTROL System**
A built-in 5-band graphic equalizer enables control of sound frequencies to suit your playing environment.
14. **SOUND CONTROL Switch**
Turns the graphic equalizer "sound control system" on and off.
15. **INPUT Selector Switch**
Place the switch in LINE (switch released) position to record from program sources connected to the LINE IN jacks in the rear panel; place in the MIC position (switch depressed) for recording with microphones.
16. **MIC Jacks**
Connects left and right microphone plugs for stereo recording with microphones; use left jack for mono recording.
17. **MPX FILTER Switch**
Set to the ON position when recording FM stereo programs with the Dolby NR System activated.

- 18. METAL Tape Selector Switch**
Depress when using metal type tapes.
- 19. MONITOR Selector Switch**
Enables monitoring of either TAPE or SOURCE. Depress the switch to monitor SOURCE; release the switch for TAPE.
- 20. DOLBY NR (Noise Reduction) B/C Type Selector**
Depress switch for DOLBY C-type noise reduction; release for B-type Dolby noise reduction.
- 21. CrO₂ Tape Selector Switch**
Depress when using CrO₂ type tapes.
- 22. SOURCE Indicator Lamp**
Lights when MONITORS Switch is set for SOURCE.
- 23. TAPE Indicator Lamp**
Lights when the MONITOR Switch is set for TAPE.
- 24. NORMAL Tape Selector Switch**
Depress when using Normal type tapes.
- 25. DOLBY NR (Noise Reduction) ON/OFF switch**
Set the switch to ON for both recording and playback using either B or C type Dolby Noise reduction.
- 26. Peak Level Meter**
Indicates the recording level when the deck is in the recording mode, and level of recorded signals during playback. The lower portion of the level meter indicates the tape selector mode (NORMAL, CrO₂, METAL) and the Dolby NR B/C selector mode setting.
- 27. Tape Counter**
An electronic digital counter that indicates the tape count. When you depress the NSPS Button, the readout switches over to the NSPS display.
- 28. MEMORY END Button**
Used for automatic stop and rewind at the end of a preselected tape position; LED glows above the switch when activated.
- 29. NSPS (NEC Search & Play System) Button**
Depress to use the automatic program search. When the NSPS Button is depressed, the tape counter switches from the tape counter display to the NSPS count display.
- 30. MEMORY START Button**
Used to set a tape for automatic start at the beginning of a preselected tape position.
LED glows above the switch when activated.
- 31. AUTO REPEAT Switch**
Used for activation of Memory Start, Memory End, Memory Repeat and Intermittent Memory Repeat functions.

FEATURES

● 3-Motor CC (Computer Control) Mechanism

The K-537's 3-Motor Computer control Mechanism does away with a plunger and clutch, thereby eliminating unstable factors during recording and playback such as clutch torque slippage and plunger shock.

With computer control, smooth and stable tape transport is always assured.

● Electronically controlled Motor in Head Mechanism

In locating the heads in the cassette portion of the K-537, a special electronic motor was employed that ensures smooth and shockless operation of the heads.

● Combination 3-Head System with Nonoxidized Copper Coil

The K-537 utilizes a combination, 3-Head (record, playback and erasure) system which offers the advantages of monitoring during recording plus independent functioning of both the record and playback heads. It also offers the advantages of flexibility in terms of head-gap setting. In conventional systems, the head-gaps are situated so that the recording head gap is normally wider than the playback head gap to improve frequency characteristics and dynamic range.

In contrast, the 3-head system used in the K-537 permits free setting of head gap width for both heads and was designed to offer additional advantages from the standpoint of timing. A six-layer laminated and highly wear resistant permalloy was used for the recording head to minimize wear to one-fourth of that of conventional heads.

Sendust was also employed in the core of this head for improved durability. For the playback head, a high-density ferrite head was used which offers reduced friction and greater resistance to temperatures and has a granular magnetic diameter reduced to less than one-half of that of conventional heads.

For the coiling, non-oxidized copper coiling with 99.99% purity was used to reduce transfer loss in high frequencies and to resolve frequency distortion, giving the K-537 its clear, sharp, distinct sound. For the erasing head, the high efficiency, double-gap type was used.

● Built-in 5-Band Graphic Equalizer "Sound Control System"

A built-in 5-band graphic equalizer "sound control system" enables adjustment of the sound field to suit your listening environment. Centering on the frequencies of 100 Hz, 330 Hz, 1 kHz, 3.3 kHz and 10 kHz, it assures excellent sound reproduction from a wide variety of tape sources.

● NSPS (NEC Search & Play System)

The handy, built-in Search & Play system developed by NEC enables you to search out up to 15 musical programs in advanced of and preceding your present tape position.

Activate the search and play system and the tape advances automatically to the program sought and begins to play.

● Memory System (Memory START/END, Auto Memory Repeat, Intermittent Memory Repeat)

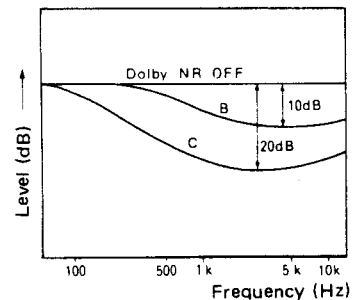
K-537's memory system features a variety of different memory functions that enable you to pick out a section of a tape and automatically replay an entire tape or tape section up to six times.

● Illuminating Peak-Level Meter

The illuminating peak level meter is easy to see, and offers a quick response for highly accurate sound level setting.

● Easy to Operate REC. MUTE

The easy to operate Record Mute Control enables you to insert a 4-sec pause at the end of each recording. This facilitates search and play, and enables you to cut out unwanted portions of programs or commercial broadcasts.



B-Type and C-Type Dolby NR

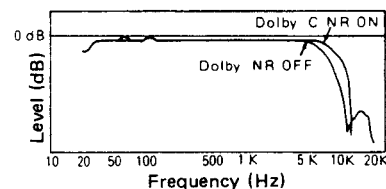


Fig. 3 Noise Reduction

DOLBY NR (NOISE REDUCTION) SYSTEM

The K-537 features both features both B-type and the latest C-type Dolby NR (Noise Reduction). Dolby NR (noise reduction) is the internationally accepted method of reducing the "hiss" noise that is generated when you playback a tape.

- Hiss noise is of very high frequencies, and becomes particularly obvious and annoying when mixing with weak (low-level) signals. Taking advantage of this fact, the Dolby NR system raises the level of high-frequency signals when recording low-level signals, then proportionately reduces the level of such high-frequency signals during playback.

Though this process the hiss noise is compressed and reduced.

Recording Level

Preset the recording levels the same as you would for recording without Dolby NR. IF you are recording with microphones or other sources with a wide dynamic range, however, set the recording levels somewhat lower.

For recording with the Dolby System:

Set the Dolby NR ON/OFF switch to ON, and set the Dolby NR B/C TYPE SELECTOR for B or C type as required.

For playback with Dolby NR:

To playback cassettes previously recorded with the Dolby NR System, set the Dolby NR ON/OFF Switch to ON, and set the B/C TYPE SELECTOR switch to match the Dolby type (B or C) used for the particular recording.

- Do not leave the Dolby system on when playing tapes that were recorded without Dolby NR, or forget to turn on the Dolby NR when recording tapes made with Dolby NR. In both instances and unnatural sound effect will be produced.

Dolby NR B-Type and C-Type

Both B-Type and the latest C-Type Dolby NR work on the principle of raising high frequency signals during recording and proportionally reducing playback to reduce "hiss" noise. However, Dolby C-Type provides twice as much noise reduction as the common Dolby B. To achieve this effect, two, 10 dB skewing processors constructed in two layers were used. In addition, spectral skewing and anti saturation network circuits were provided to improve

high-frequency linearity. Other effects of Dolby C-type include better noise reduction than B-type at low frequencies and reduction of breathing noise without causing a noticeable change in the sound quality.

DOLBY NR SYSTEM * MPX FILTER SWITCH * TIPS FOR BETTER RECORDING

● Amount of Noise Reduction

As shown in Fig. 10, Dolby B type NR improves the signal-to-noise ratio by 10 dB at 5 kHz, and the new C-type improves it by 20 dB at 5 kHz, in comparison to when the Dolby system is off. Dolby C-type also operates at lower frequencies than B-type to offer a noise reduction effect in the midrange of the lower frequencies.

● Anti-saturation Network

Dolby C-type features an anti-saturation network to prevent sound saturation by raising weak signals during recording and restoring them to original levels during playback. The result is that whereas saturation will occur for high input levels with Dolby B-type, with C-type saturation it is not produced at high input levels (see Fig. 3).

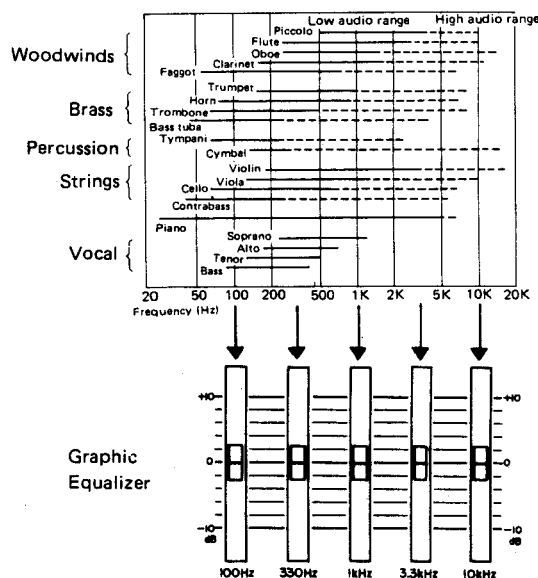


Fig. 4 Response Ranges for Instruments and Vocals

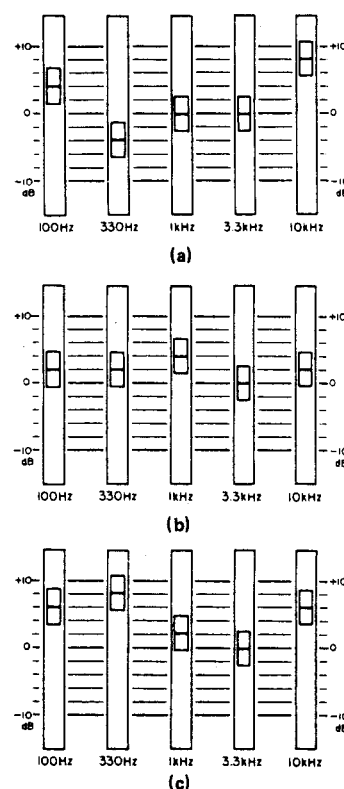


Fig. 5 Equalizer Settings

Proceed as follows:

1. Set the tape deck's monitor switch to SOURCE.
2. Set the REC Level Selector to the appropriate level.

3. Set the SOUND CONTROL Switch to ON.

4. Adjust the graphic equalizer Sound Control knobs to create the desired sound effect.

USING THE GRAPHIC EQUALIZER "SOUND CONTROL SYSTEM"(Fig. 4)

How to Use the Sound Control System

The sound control system consists of the built-in graphic equalizer which is operated by independent Sound Control Knobs.

The Graphic Equalizer

The K537's built-in graphic equalizer features 5-bands centering on frequencies of 100 Hz, 330 Hz, 1 kHz, 3.3 kHz and 10 kHz. By sliding the Sound Control Knobs upward the response is increased for a respective frequency, by sliding them downward the response is weakened. By thus manipulating the Sound Control Knobs for the respective frequency bands, the overall sound field can be controlled to suit your listening environment. This not only allows you to create a flatter sound, but also permits you to create the effect of a live recording. A "disco" effect can be added to tapes for playing with a car stereo, for example, or the equalizer can be used simply to reduce tape hiss. Through adjustment the five knobs of the graphic equalizer, you can enter a new world of sound recording.

- 100 Hz: Has the effect of stabilizing sound; ideal for livening the effect of bass guitar and drums.
- 330 Hz: The basic frequency for male vocals and musical playback.
- 1 kHz: The ideal frequency around which piano and woodwinds (female vocals) should be adjusted.
- 3.3 kHz: Brings out the brilliance of violin and other string instrument solos; the most pleasing frequency for listening.
- 10 kHz: Strengthens the effect of cymbals, triangles and other sharp sounding instruments.

Creating Various Sound Effects

To give a car stereo the effect of your listening room:

Create a wide range and live effect by centering the mid-range frequencies and strengthening the high and low frequencies. (Fig. 5a)

To add a feeling of liveliness to a female vocal:

Increase the response in the mid-range frequencies to add a warmth to the overall sound, and highlight the vocal. (Fig. 5b)

To create an impressive sound with small speakers:

Strengthen the high and low frequencies to create a brilliant, impressive sound with small speakers. (Fig. 5c)

The Sound Control Switch

This is the main control for the graphic equalizer. When using the equalizer, set the switch to ON. Experiment with various sound effects with the switch both ON and OFF, to compare the effect of equalizer with the original sound.

Other Uses of the Graphic Equalizer

The K-537's built-in graphic equalizer need not only be used in conjunction with the tape deck. When not playing tapes, it can also be used solely as a graphic equalizer to create different sound effects for other stereo components.



Fig. 6

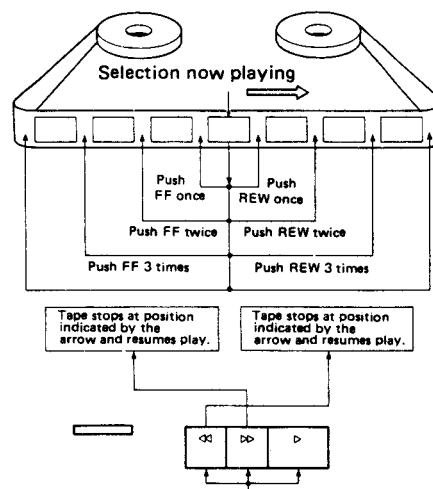


Fig. 7 Locating Selections in Advance of and Preceding the Present Tape Position

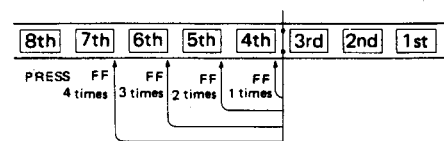


Fig. 8 Locating Selections in Advance With the Tape Positioned in between Selections

USING SPECIAL FEATURES

NSPS (NEC Search & Play System) (Fig. 6, 7)

The K-537 has a built-in search and play system (NSPS) which searches out the blank recording at the beginning of each selection, and starts the tape playback at the desired section, and starts the tape playback at the desired section. The system allows you to locate up to 15 selections in advance of or preceding your present tape position. The system works on the Principle of locating four-second blank spaces inserte at the beginning of each recording (to make 4-sec. blank recordings between selections, use the REC. MUTE system.)

Sample operation of the search and play system:

The NSPS works like this. If you are listening to selection 4, for example, and you wish to skip to selection 5:

1. Press the NSPS Button. The tape counter display will switch from the tape count display and display the NSPS count.
2. Press the fast forward button once. The NSPS count display will switch from "0" to "1", and the tape deck will begin locating the next selection (one blank space in advance of the present tape position). When it reaches the blank space before selection 5, the counter display will return to "0" and the selection will be played automatically.

If you wish to locate selection 7 from selection 4:

As selection 7 is three blank spaces in advance of selection 4 (i.e., 4th – blank 1 – 5th – blank 2 – 6th – blank 3 – 7th), press the FF Button three times; the NSPS count display will indicate "3" and count down until it locates selection 7. When it locates the selection, the NSPS count returns to "0" and automatically plays the selection.

To locate the preceding selection:

As selection 3 is two blank spaces behind selection 4 (i.e., 4th – blank 1 – 3rd – blank 2), press the rewind button twice. When selection 3 is located, the counter display will return to "0" and the selection will play automatically.

To locate selection 1 from selection 4:

As selection 1 is four blank spaces behind selection 4, (i.e., 4th – blank 1 – 3rd – blank 2 – 2nd – blank 3 – 1st – blank 4), press REW four times. The NSPS count will display "4" and count down. When it reaches "0", the tape deck will automatically play selection 1.

To locate another selection with the tape positioned in between selections:

If the tape is positioned at the blank space before selection 4, for example, and you wish to locate selection 7, press the FF Button four times (once additionally to count the blank space before selection 4, see Fig. 8).

Correcting Errors:

1. If you press the FF or REW Button one time too many, you may correct error by pressing the opposite button. For example, if you've pressed the FF Button three times instead of two, press the REW Button once to correct the error, and visa versa.
2. If you should happen to accidentally press the Memory Start or Memory End Buttons while the NSPS is activated, the memory system cancels search and play operation and display. If this occurs, reactivate the NSPS.

Memory Start and Memory End Functions

The memory start and memory end system is used to search out preselected portions of the tape you wish to listen to. It enables you to automatically start or stop the tape at any position you desire.

A. Memory Start (Fig. 9)

1. Press the memory start button during recording or playback; the LED above the button lights to indicate that a memory start signal has been encoded for the tape.
2. Press the REW Button to rewind the tape when you reach the end of the section you are recording or playing back. When the tape reaches the point where the original memory start signal was encoded, it will stop automatically.
1. Press the AUTO REPEAT Button at this point; playback will automatically begin.

B. Memory End (Fig. 10)

1. Later, if you wish to encode the tape to stop automatically at a certain point during playback, press the Memory End Button when the tape reaches that point; the LED will light to indicate that a memory end signal has been encoded for the tape.
2. During subsequent playback, the tape will stop automatically at the point where you initially encoded the memory end signal.
3. Press the AUTO REPEAT Button at this point; the tape will automatically start to rewind.

Memory Repeat/Intermittent Memory Repeat

The K-537 also features memory repeat and intermittent memory repeat functions which allow you to repeat either the entire side of a tape up to six times or an preselected portion of the tape up to six times. These are used as follows.

A. Memory Repeat (Fig. 11)

1. Set the AUTO REPEAT Button to ON.
2. Press the Play button to start the tape.
3. When the tape reaches the end, it will automatically rewind and playback again from the beginning.

B. Intermittent Repeat (Fig. 12)

1. Set the AUTO REPEAT Switch to ON.
2. Press the Play button to start the tape.
3. When the tape reaches the point where you wish to have it start automatically for future use, press the MEMORY START Button; the LED will light above the button to indicate that a memory start signal has been encoded at this point.
4. When the tape reaches the end of the section you wish to have repeated, press the MEMORY END Button (LED above the button will light indicating that a memory end signal has been programmed at this point).
5. Press the REW Button to rewind the tape.
6. The tape will rewind until it reaches the point where the memory start button was originally pressed. From this point it will automatically replay up six times between the points where the memory start and memory end signals were encoded.

NOTE 1: If you activate the memory system while the tape is stopped, that tape position will not be memorized. If this occurs, operate the memory from the previously memorized tape position.

NOTE 2: The intermittent memory repeat functions only for sections of tape with a tape count of "14" or less. To program a section of tape with a count of less than 15 for automatic playback, program the memory end at a point where the count exceeds "14" beyond the end of the selection. (As shown in Fig. 13, program between points a and c, instead of a and b).

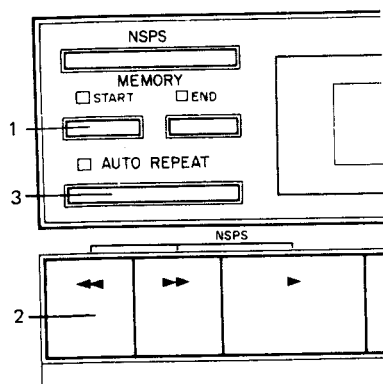


Fig. 9 Encoding a Memory Start Signal

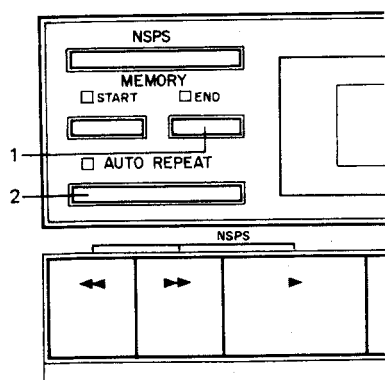


Fig. 10 Encoding a Memory End Signal

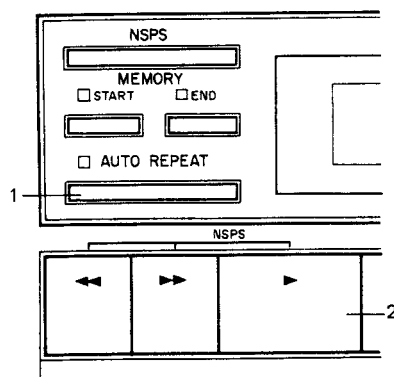


Fig. 11 Memory Repeat Procedure

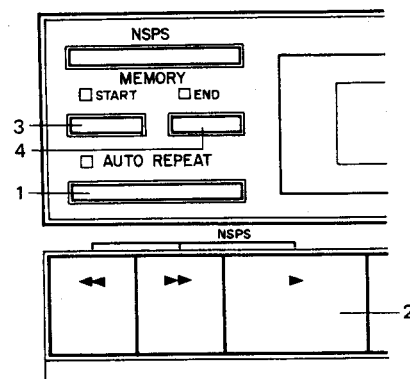


Fig. 12 Memory Repeat Procedure

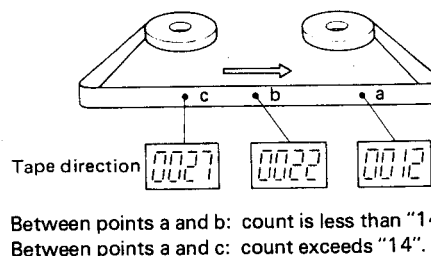


Fig. 13 Program auto memory repeat for sections of tape with a tape count of "14" or less

REC MUTE BUTTON (For Creating Blank Intervals between selections on the tape)(Fig. 14)

The REC MUTE (Record Mute) Button is used for automatically creating blank recording space between the selections on your tapes. When pressed at the end of a selection, it creates a blank interval of 4 seconds before the next selection. This feature is highly useful for creating the 4-second pause between selections that is necessary for the NEC Search and Play system to operate, and can also be used for cutting out unwanted talk and commercials when taping a broadcast.

To Create 4-second blank recordings automatically:

1. Press the REC Button to start the recording.
 2. When you reach the end of the selection you are recording, immediately press the REC MUTE Button. This automatically inserts a 4-second blank recording at the end of the selection of the tape, and switches the deck over to the PAUSE (REC Stand-By) mode.
 3. When you're ready to resume recording, press PAUSE manually; the deck will automatically record the next selection.
- The REC Button indicator flashes while the blank recording is being made.

To create blank recordings less than 4 seconds:

Blank recordings of less than 4 seconds may be created between selections by pressing the REC MUTE Button a second time, at the desired interval, before the initial 4 seconds have elapsed. In this instance, the tape deck bypasses the pause mode and immediately resumes recording.

To create blank recordings longer than 4 seconds:

To create blank intervals longer than four seconds on the tape, simply hold the REC MUTE Button depressed for the desired length of time. The deck automatically switches over to record standby mode, when you release your finger.

Double Automatic REC MUTE:

If you press the REC MUTE Button a second time while the deck is in the record standby mode (i.e., PAUSE and REC or PLAY indicators lit), the REC button will flash. When you press the PAUSE button point to advance the tape, and a second 4-second blank interval will be recorded on the tape. After the second blank recording, the deck automatically reverts again to record standby.

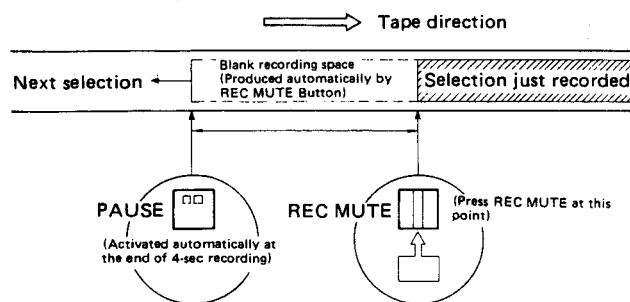
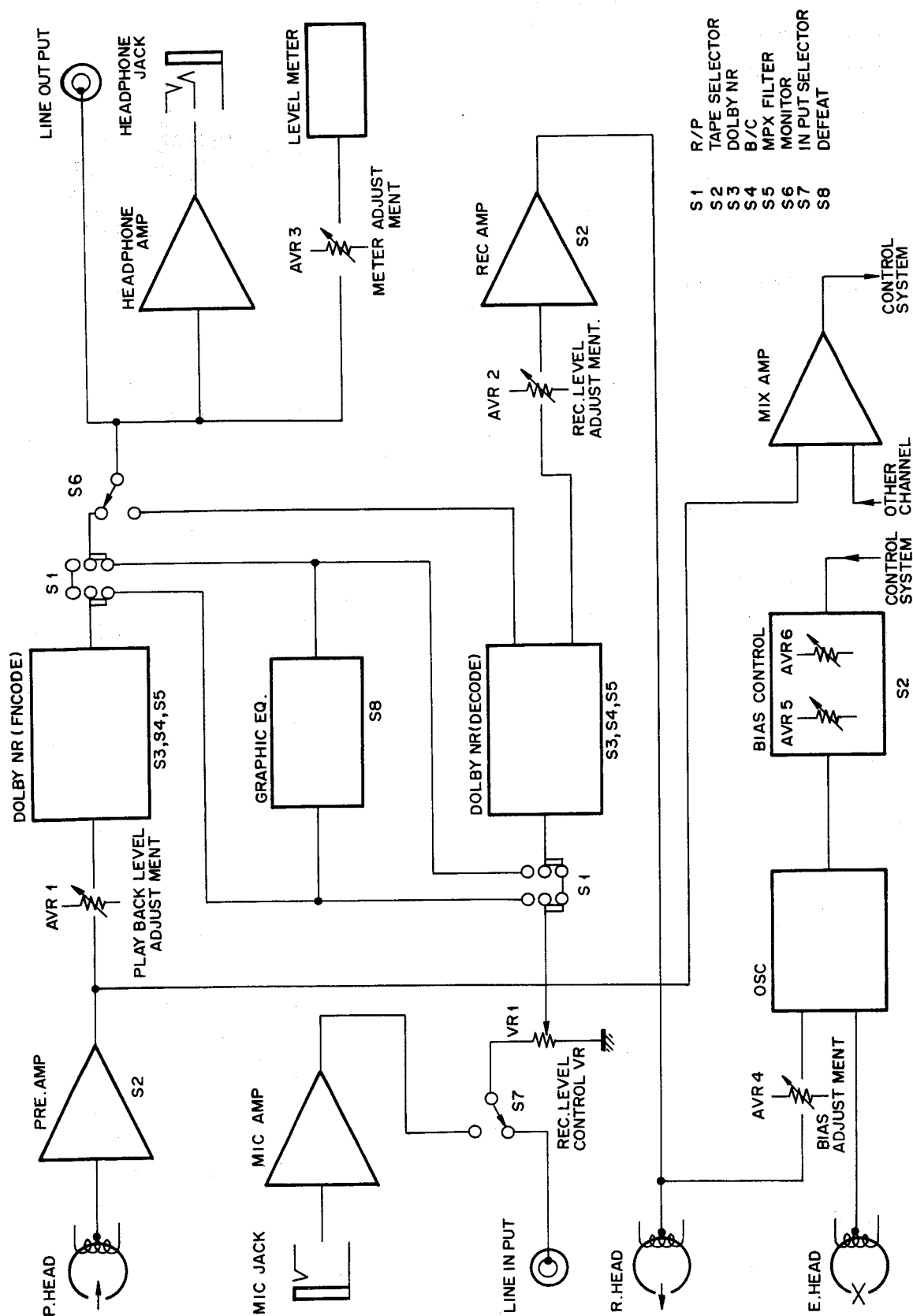


Fig. 22 Making Blank Recording with the REC MUTE Button

BLOCK DIAGRAM



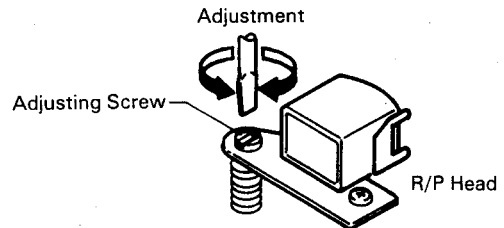
S1 R/P
 S2 TAPE SELECTOR
 S3 DOLBY NR
 S4 B/C
 S5 MPX FILTER
 S6 MONITOR
 S7 IN PUT SELECTOR
 S8 DEFEAT

ALIGNMENT PROCEDURE

1. Head Azimuth Adjustment

Playback an azimuth adjusting tape (6.3 kHz or 10 kHz), and adjust the head adjusting screw to the maximum output level. (TEAC MTT-144)

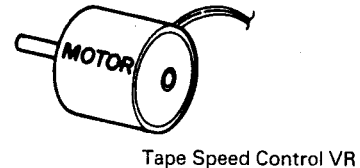
Setting:	Play
Input:	Tape (6.3 kHz or 10 kHz)
Output:	Line output (Connect voltmeter.)



2. Tape Speed Adjustment

Play back a standard test tape (3 kHz, TEAC MT-111), and adjust the variable resistor on the motor so that the output will be $3 \text{ kHz} \pm 10 \text{ Hz}$ while checking the output with the frequency counter.

Setting:	Play
Input:	Tape (3 kHz)
Output:	Line output (Connect frequency counter.)

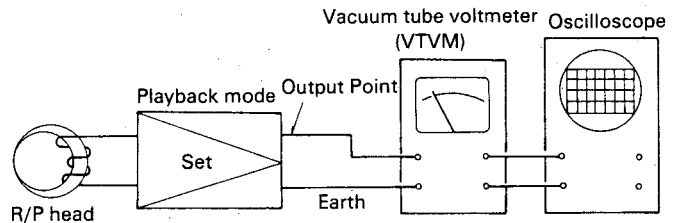


3. Playback Sensitivity Adjustment

Playback a Dolby calibration tape (400 Hz, 200 pwb m/m), and adjust the semi-fixed AVRs so that the output will be 550 mV.

L CH: VR101
R CH: VR201

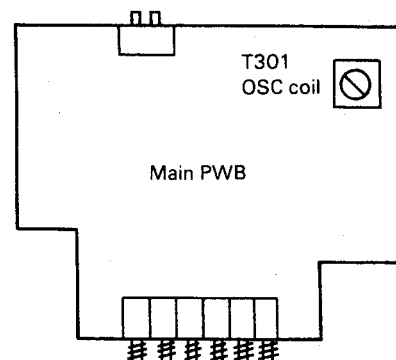
Setting:	Play (Dolby SW ON, tape Fe_2O_3)
Input:	Tape (TEAC MTT-150)
Output:	Line output



4. Oscillator Frequency Adjustment

Connect a frequency counter to both ends of the erase head, and adjust the OSC coil so that the oscillator frequency will be $87 \text{ kHz} \pm 5 \text{ kHz}$.

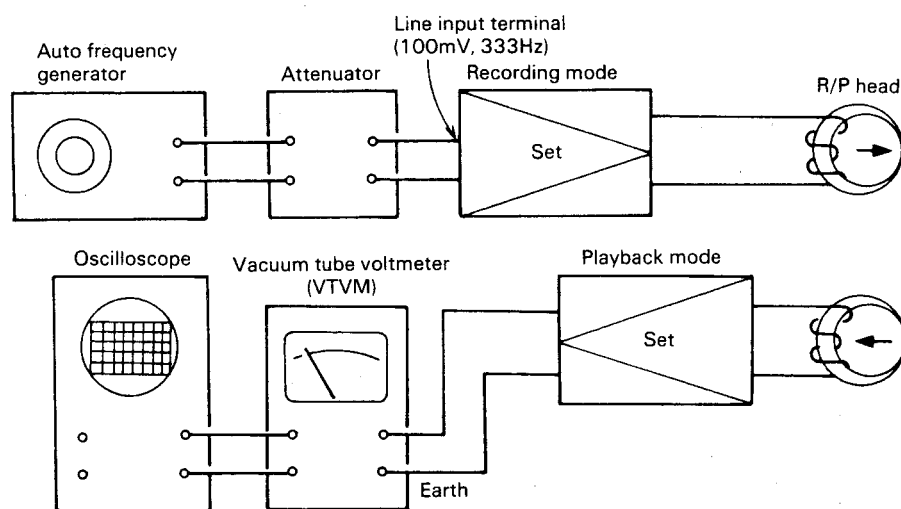
Setting:	Record
Output:	Both ends of erase head



5. Record and Playback Sensitivity Adjustment

- Select the record mode, apply a 333 Hz, 100 mV input to the line input, and adjust the record control to 550 mV at the output terminal.
- Then Adjust VR103 (L CH) and VR203 (R CH) so that the current flowing to the head will be $63 \mu\text{A}$. Make this adjustment in the metal tape mode.
- Make sure that the recorded or reproduced output after the above adjustments is 550 mV. If it is not, adjust the recording current again.

Setting:	Record
Input:	Line input
Output:	Line output



6. Bias Current Adjustment

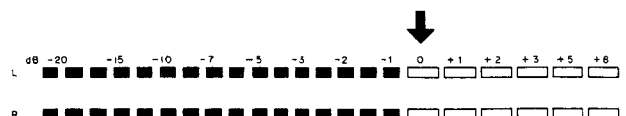
- Record and playback and metal tape, and adjust the bias current controls (VR102 for L CH, VR202 for R CH) until the level difference between the recording and playback frequencies is 0 dB.
- Then record and play back a normal tape and chrome tape, and adjust VR303 and VR302 until the level difference between the recording and playback frequencies at 333 Hz and 10 kHz is less than $\pm 1.5 \text{ dB}$.

Setting:	Record, play
Input:	Line input (330 Hz or 10 kHz, 100 mV)
Output:	Line output

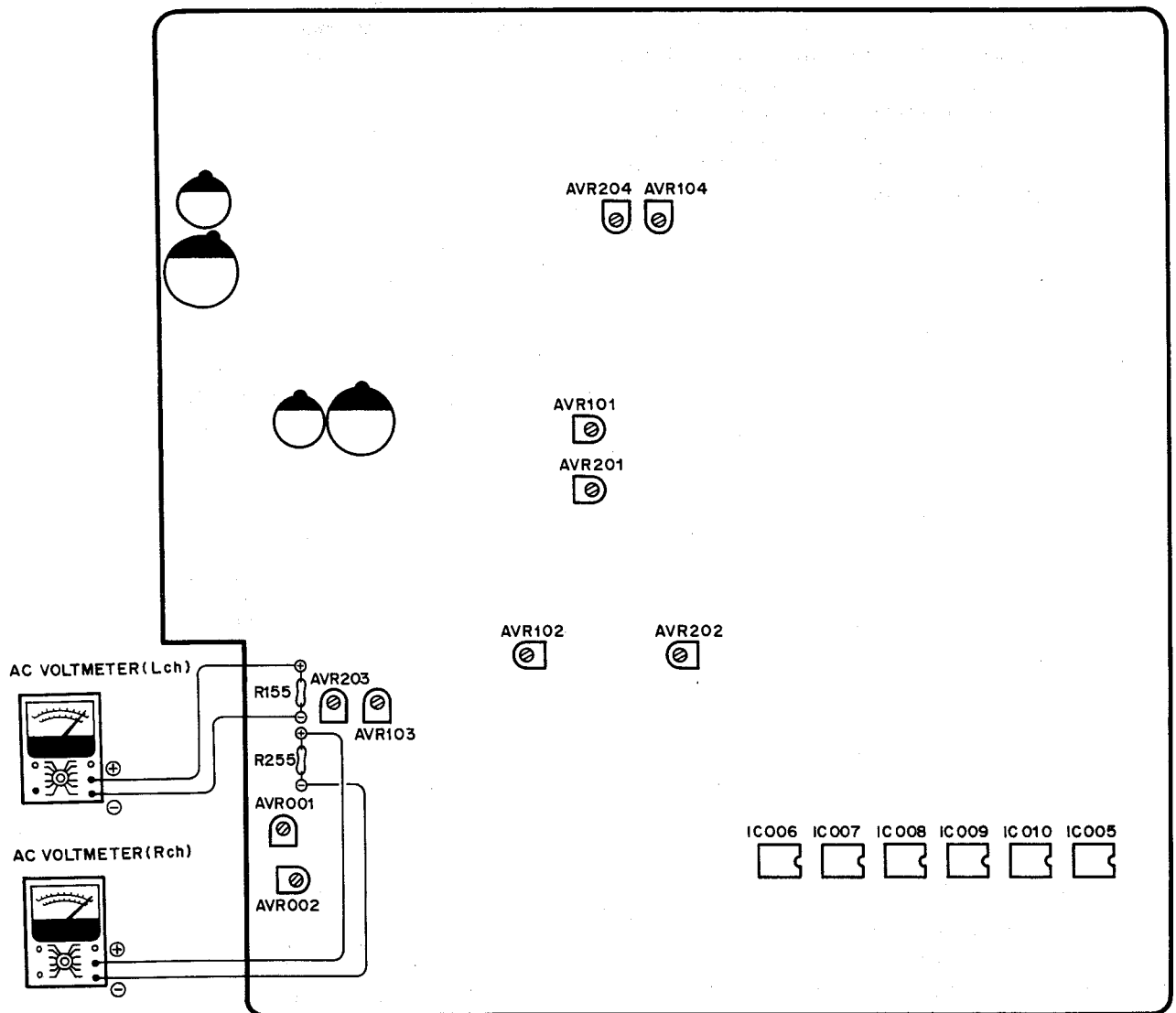
7. Level Meter Adjustment

Apply a 333 Hz 100 mV signal input to the line input (after adjusting the recording control to a line output of 400 mV), adjust AVR104 (L CH) and AVR204 (R CH) to a point where the 0 dB LED just begins to light.

Setting:	Record
Input:	Line input (333 Hz, 100 mV)
Output:	Line meter

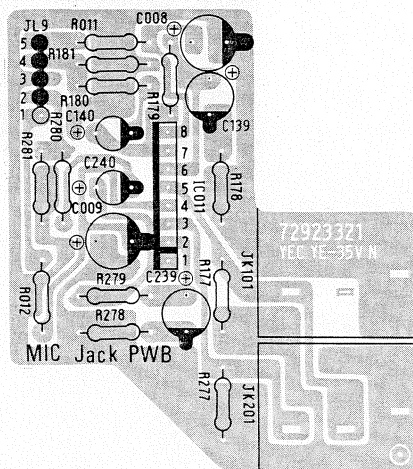


7. Alignment Location

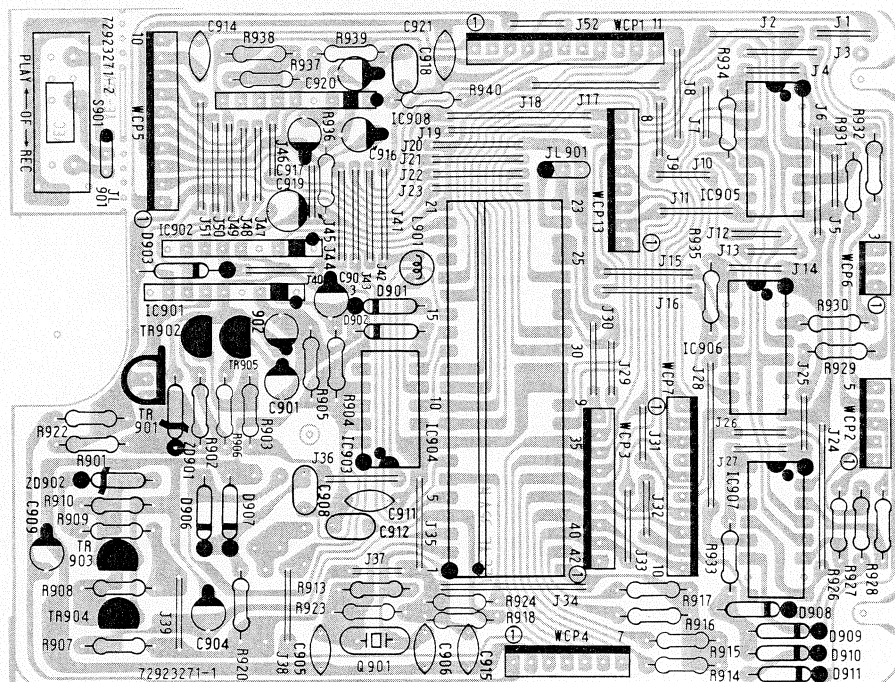


PWB ASSY

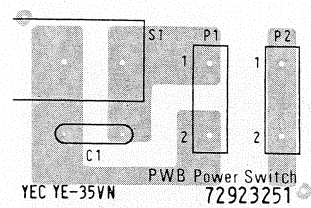
MIC JACK PWB ASSY (Solder Side)



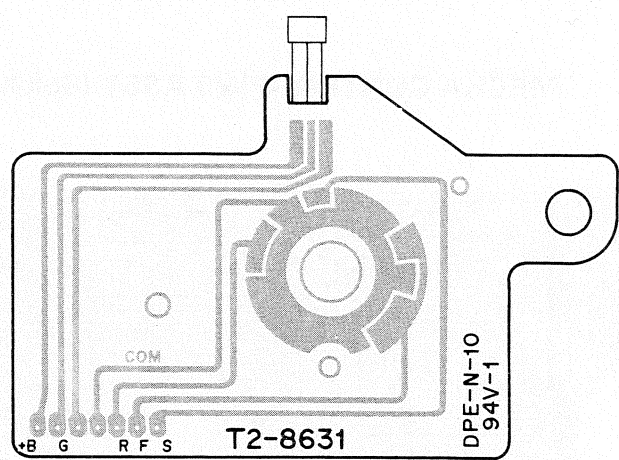
MECHA CONTROL PWB ASSY (Solder Side)



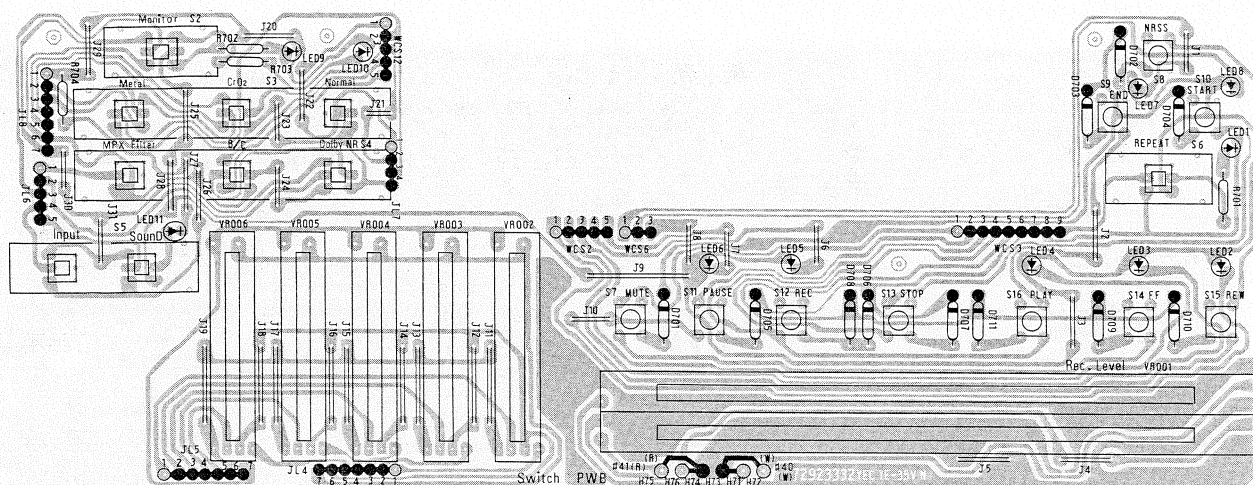
POWER SUPPLY PWB ASSY (Solder Side)



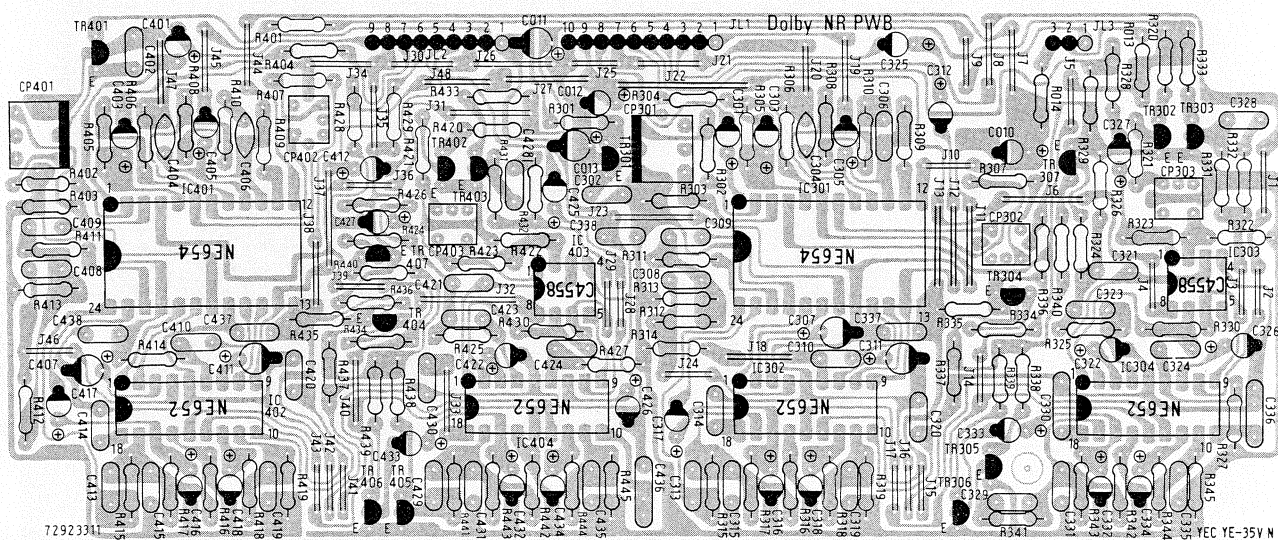
CAM PWB (Solder Side)



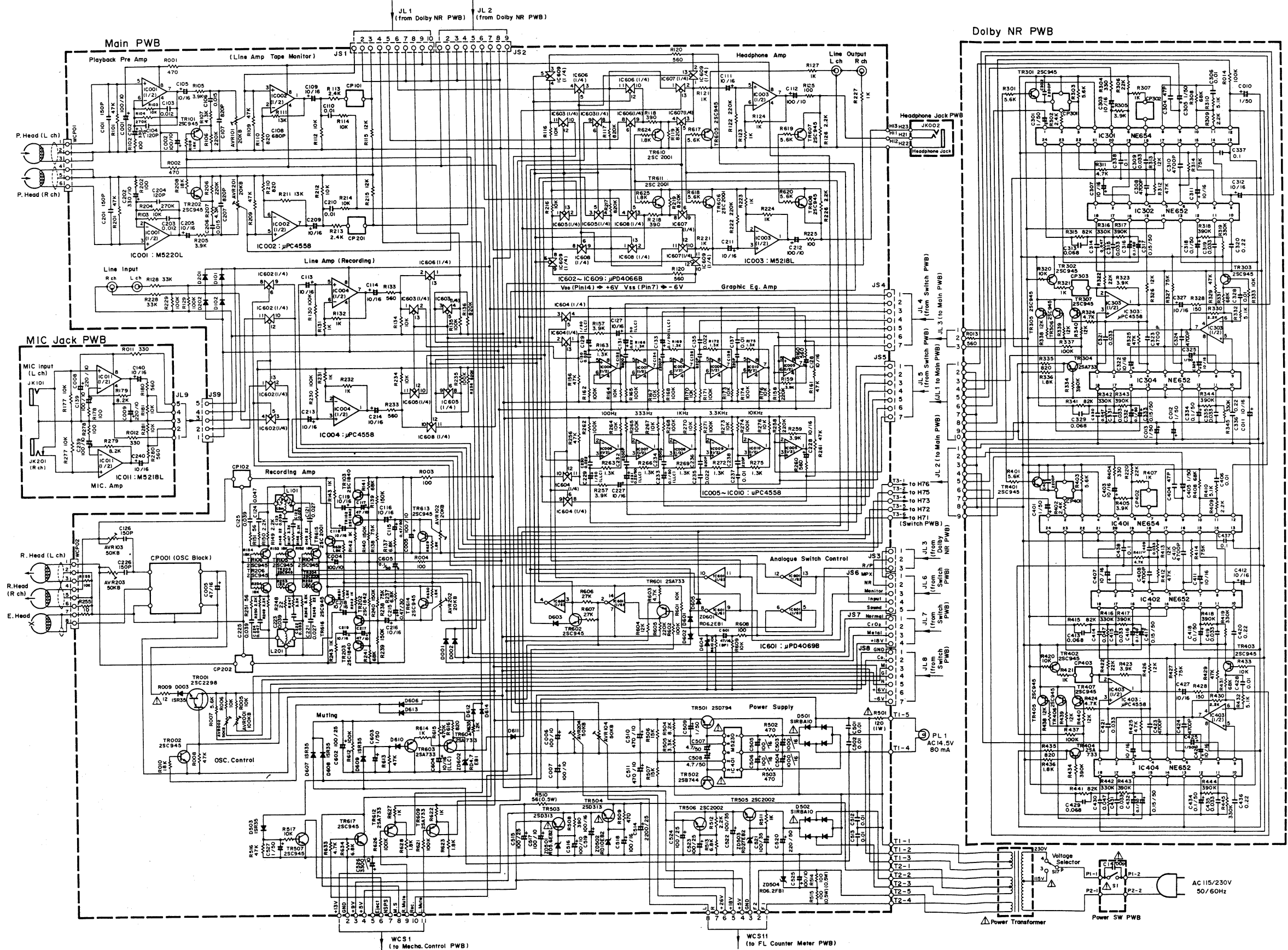
SWITCH PWB (Solder Side)



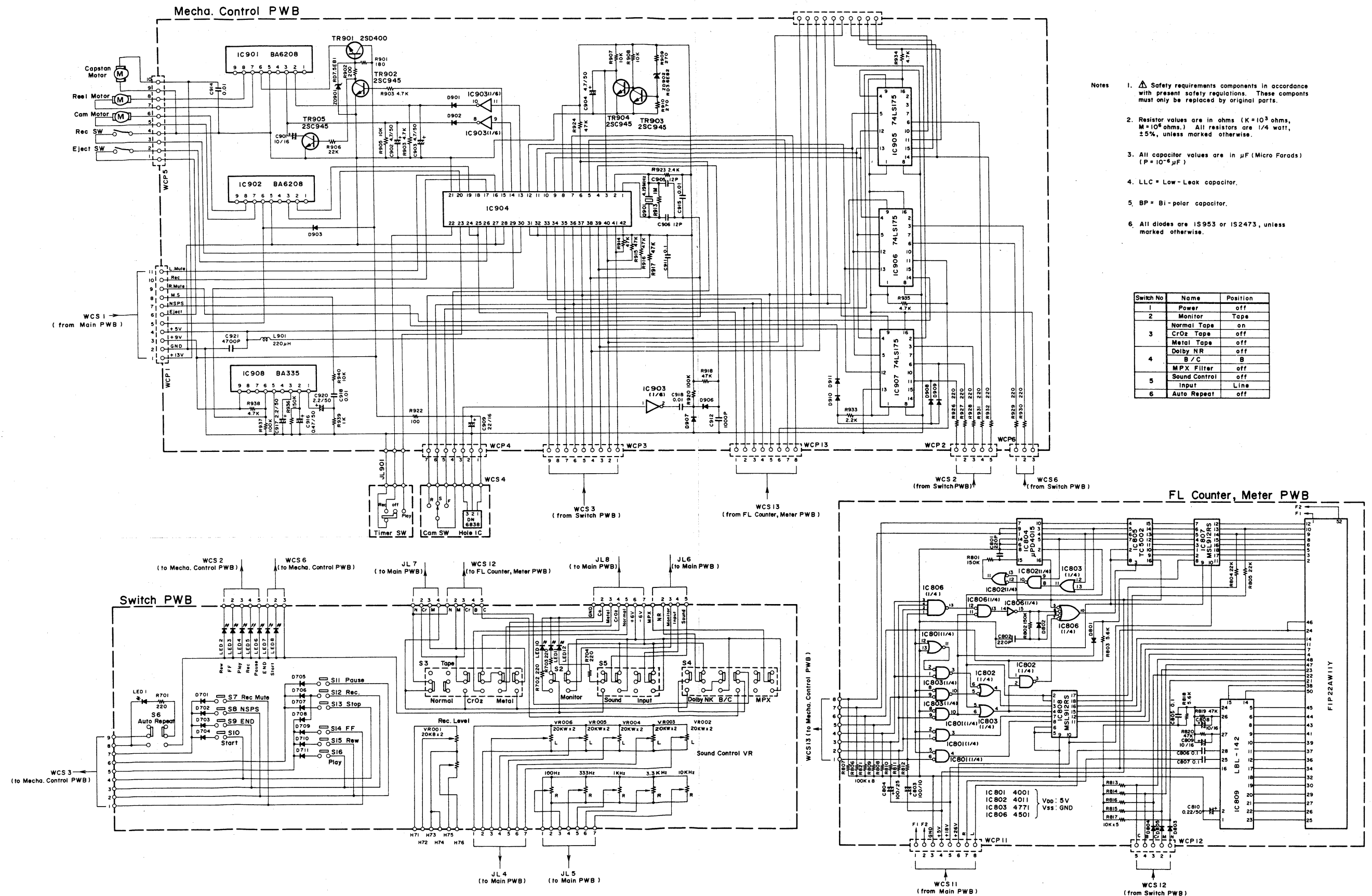
DOLBY PWB (Solder Side)



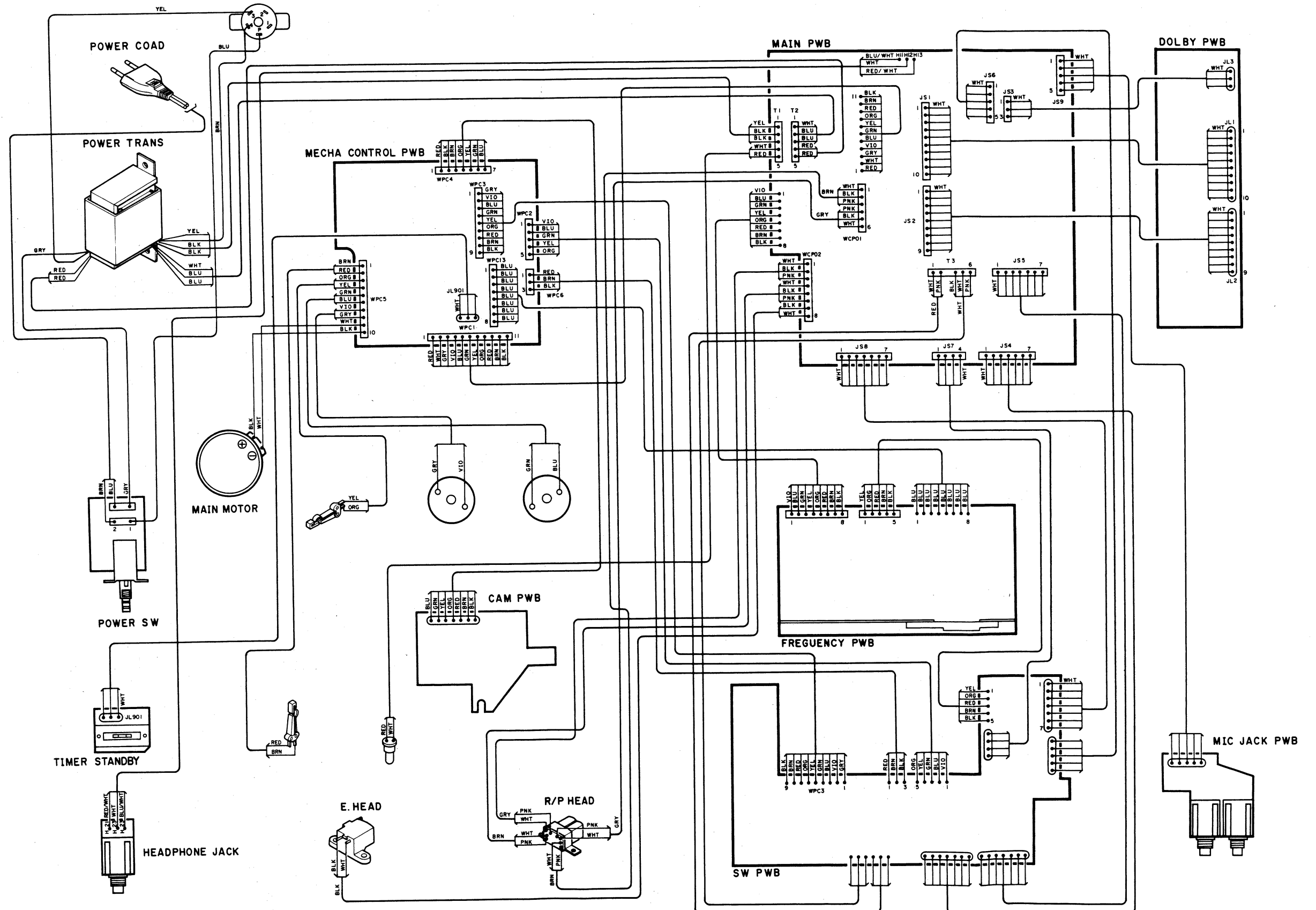
SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



WIRING DIAGRAM



REPLACEMENT PARTS LIST

Note: The components identified by Δ mark or with the symbol Nos. shaded are critical for safety. Replace only with parts Number specified.

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** ICS **

IC905	IC906	IC907	37051093	IC SN74LS175N (D-F.F)	3
IC002	IC004	IC005	37101034	IC UPC4558	10
IC006	IC007	IC008			
IC009	IC010	IC303			
IC403					
IC003	IC011		37901081	IC M5218L	2
IC001			37901119	IC M5220L	1
IC301	IC401		37901120	IC NE654 (DOLBY-C)	2
IC302	IC304	IC402	37901121	IC NE652 (DOLBY-C)	4
IC404					
IC908			37901122	IC BA335	1
IC909			37903049	IC DN6838	1
IC602	IC603	IC604	37903121	IC UPD4066B	8
IC605	IC606	IC607			
IC608	IC609				
IC904			37903147	IC MB8841-422M	1
IC901	IC902		37903148	IC-BA6208	2
IC501			37903177	IC M5230L	1
IC601	IC903		37904036	IC UPD4069BC	2

** TRANSISTORS **

TR304	TR404	TR601	35003517	TR,2SA733/733A Q	7
TR603	TR604	TR609			
TR612					
TR502			35025517	TR,2SH744 Q	1
TR902	TR903	TR904	35047216	TR,2SC945 P	4
TR905					
TR002	TR101	TR104	35047217	TR,2SC945Q	32
TR105	TR106	TR201			
TR204	TR205	TR206			
TR301	TR302	TR303			
TR305	TR306	TR307			
TR401	TR402	TR403			
TR405	TR406	TR407			
TR507	TR602	TR607			
TR608	TR613	TR614			
TR617	TR902	TR903			
TR904	TR905				
TR605	TR606	TR610	35055312	TR 2SC2001 L	6
TR611	TR615	TR616			

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** TRANSISTORS **

TR505	TR506	35947212	TR 2SC2002L	2
TR102	TR202	35951105	TR,2SC1842 E	2
TR103	TR203	35951705	TR,2SC1840 E	2
TR001		35952202	TRANSISTOR 2SC2298 (B)	1
TR501		35962616	TR 2SD794P	1
TR503	TR504	35964305	TR 2SD 313 E	2
TR901		35965005	TR,2SD400(E)-P2	1

** DIODES **

D901	D902	D906	360K1009	DIODE,SI.1S2473	8
D907	D908	D909			
D910	D911				
D001	D002	D101	360K1522	DIODE 1S 953	28
D102	D201	D202			
D601	D602	D603			
D604	D605	D606			
D610	D611	D612			
D613	D614	D701			
D702	D703	D704			
D705	D706	D707			
D708	D709	D710			
D711					
D501	D502	Δ	36902065	RECTIFIER BLOCK SIRBA10	2
D003	D503	D607	36902088	DIODE 1SR35100HM	6
D608	D609	D903			
LED6			36904184	LED SLR54YT20 13MMH	1
LED10	LED11	LED1	36904185	LED SLR54MT20 13MMH	9
LED2	LED3	LED4			
LED7	LED8	LED9			
LED5			36904186	LED SLR54VT20 13MMH	1
ZD902			36905030	ZENER,DIODE RD-3.6EB2-H	1
ZD602			36905042	ZENER,DIODE RD-5.6EB1-H	1
Z0501			36905043	ZENER,DIODE RD-5.6EB2-H	1
ZD601			36905045	ZENER,DIODE RD-6.2EB1-H	1
ZD901			36905051	ZENER,DIODE RD-7.5EB1-H	1
ZD502			36905061	ZENER,DIODE RD-10E B2-H	1
ZD503			36905093	ZENER,DIODE RD-27E B2-H	1
ZD504			36905342	DIODE RD6.2F B1	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** TRANSFORMERS **

T1	△ 45027125	TRANS POWER K537E	1
----	------------	-------------------	---

** VARIABLE RESISTORS **

VR001	41940077	R,VARIABLE,SLIDE	1
VR002 VR003 VR004	41940078	R,VARIABLE,SLIDE	5
VR005 VR006			
AVR002 AVR104 AVR204	41950023	R,VARIABLE 50KB	3
AVR001	41950024	R,VARIABLE 100KH,B	1
AVR101 AVR102 AVR201	41950027	R,VARIABLE 20K,B	4
AVR202			
AVR103 AVR203	41952014	R,VARIABLE 50KB	2

** PWB ASSY **

PA1	87767101	MAIN PWB FULL ASSY	1
PA2	87767201	DOLBY NR PWB FULL ASSY	1
PA5	87767301	MIC JACK PWB FULL ASSY	1
PA6	87767401	SWITCH PWB FULL ASSY	1
	87767701	POWER SWITCH PWB FULLASSY	1

** MISCELLANEOUS PARTS **

A054	19532231	SPRING,EJECT LEVER	1
A038	19534651	COIL SPRING	4
CP302 CP303 CP402	39903026	COIL,SPECTRAL SKEWING	4
CP403			
CP001	39904005	OSC BLOCK (537)	1
CP301 CP401	39907022	FILTER,LOW-PASS	2
CP101 CP201	39907023	FILTER	2
CP102 CP202	39907024	FILTER,LOW-PASS	2
L101 L201	61911176	REC.EQ.COIL (537)	2
Q901	64920141	X,TAL 4.19MHZ	1
	△ 65901053	SW,SELECTOR	1
S901	65902107	SLIDE SWITCH 2-3	1
S10 S11 S12	65904332	SW	10
S13 S14 S15			
S16 S7 S8			
S9			

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** MISCELLANEOUS PARTS **

S1	△ 65904336	POWER SW SDL	1
S2 S6	65904360	SWITCH,PUSH SEA-1	2
S5	65904361	SWITCH,PUSH SEA-2	1
S4	65904362	SWITCH,PUSH SEA-3	1
S3	65904372	SWITCH,PUSH BLOCK	1
PA7	67950287	METER COUNTER FL UNIT	1
	70599056	POWER ADAPTER S-16115	1
PC	70803020	LINE,CORD CENELEC 1.8M	1
	70906092	PIN COAD	2
P1 P2	71905169	TERMINAL 2P	2
JK001	71905227	4P RCA PINJACK L-248	1
A057	72952331	MECHANISM UNIT C-248	1

** CABINET & KNOBS **

A003	18290731	FOOT,RUBBER (H9.0)	4
A004	18469001	POWER,BUTTON	1
A007	18469011	EJECT,BUTTON	1
A006	18469141	KNOB TIMER	1
A036	18469371	KNOB,PUSH(A)	1
A037	18469381	KNOB,PUSH(B)	2
A008	18469391	KNOB,PUSH(C)	1
A009	18469401	KNOB,PUSH(D)	2
A010	18469411	KNOB,PUSH(E)	4
A011	18469421	KNOB,PUSH(F)	2
A012	18469431	KNOB,SLIDE POTS	5
A020	18469451	MECHANISM,BUTTON(FE)ASSY	1
A021	18469471	MECHANISM,BUTTON(REW)ASSY	1
A022	18469491	MECHANISM,BUTTON ASSY	1
A023	18469511	MECHANISM,BUTTON ASSY	1
A024	18469531	MECHANISM,BUTTON(REC)ASSY	1
A025	18469551	MECHANISM,BUTTON(STOP)	1
A026	18469561	MECHANISM,BUTTON(R,MUTE)	1
A027	18469611	CONTROLS KNOB ASSY	2
A062	18470421	KNOB PUSH (G)	1
A001	19350201	CABINET	1
A005	19408372	POWER SW LEVER	1
	88770701	FRONT PANEL S,ASSY	1

SYMHOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** COILS & FILTERS **

L901	61052033	COIL, FILTER 220UH	1
------	----------	--------------------	---

** PACKING MATERILS **

	19806811	CARTON BOX	1
	78923801	INSTRUCTION BOOKLET K537E	1

** RESISTORS **

R510		40351141	R, METAL 47H 5% 1W	1
R501		40351151	R, METAL 120H 5% 1W	1
R009		40809772	R, FUSE, 12H 1/4W 2X	1
R514	R515	40912149	R, CARBON 100H 5% 1/2W	2
R003	R004	40913149	R, CARBON 100H 5% 1/4W	2
R509		40913161	R, CARBON 330H 5% 1/4W	1
R502	R503	40913165	R, CARBON 470H 5% 1/4W	2
R143	R245	40913173	R, CARBON 1.0K 5% 1/4W	3
R508		40913175	R, CARBON 1.2K 5% 1/4W	1
R178	P278	40982149	R, CARBON 100H 5% 1/4W	2
R011	R012	40982161	R, CARBON 330H 5% 1/4W	2
R160	R180	40982167	R, CARBON 560H 5% 1/4W	3
R935		40982189	R, CARBON 4.7K 5% 1/4W	1
R179	R279	40982195	R, CARBON 8.2K 5% 1/4W	2
R177	R181	40982197	R, CARBON 10K 5% 1/4W	5
R281	R941			
R156	R161	40982213	R, CARBON 47K 5% 1/4W	2
R155	R255	409H2625	R, CARBON 10H 5% 1/4W	2
R145	R148	409H2633	R, CARBON 22H 5% 1/4W	4
R248				
R151	R251	409H2643	R, CARBON 56H 5% 1/4W	2
R102	R125	409H2649	R, CARBON 100H 5% 1/4W	8
R202	R225			
R608	R922			
R328	R428	409H2653	R, CARBON 150H 5% 1/4W	2
R901		409H2655	R, CARBON 180H 5% 1/4W	1
R902		409H2656	R, CARBON 200H 5% 1/4W	1
R701	R702	409H2657	R, CARBON 220H 5% 1/4W	11
R704	R926			
R928	R929			
R931	R932			
R909	R910	409H2659	R, CARBON 270H 5% 1/4W	2

SYMHOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** RESISTORS **

R304	R404	409H2661	R, CARBON 330H 5% 1/4W	2
R118	R218	409H2663	R, CARBON 390H 5% 1/4W	2
R001	R002	409H2665	R, CARBON 470H 5% 1/4W	2
R013	R120	409H2667	R, CARBON 560H 5% 1/4W	6
R220	R233	409H2667	R, CARBON 560H 5% 1/4W	6
R110	R210	409H2671	R, CARBON 820H 5% 1/4W	5
R435	R616			
R121	R123	409H2673	R, CARBON 1.0K 5% 1/4W	22
R127	R131			
R142	R221			
R224	R227			
R232	R242			
R321	R407			
R614	R622			
R939	R627			
R635		409H2675	R, CARBON 1.2K 5% 1/4W	1
R163	R166	409H2676	R, CARBON 1.3K 5% 1/4W	10
R172	R175			
R266	R269			
R275	R272			
R336	R436	409H2679	R, CARBON 1.8K 5% 1/4W	10
R624	R625			
R629	R630			
R632	R631			
R126	R149	409H2681	R, CARBON 2.2K 5% 1/4W	12
R226	R249			
R309	R330			
R430	R512			
R113	R213	409H2682	R, CARBON 2.4K 5% 1/4W	5
R402	R923			
R147	R247	409H2685	R, CARBON 3.3K 5% 1/4W	3
R105	R157	409H2687	R, CARBON 3.9K 5% 1/4W	10
R205	R257			
R305	R323			
R423	R405			
R107	R207	409H2688	R, CARBON 4.3K 5% 1/4W	2
R311	R324	409H2689	R, CARBON 4.7K 5% 1/4W	9
R424	R603			
R903	R934			
R310	R332	409H2690	R, CARBON 5.1K 5% 1/4W	4
R432	R410			
R007	R301	409H2691	R, CARBON 5.6K 5% 1/4W	9
R401	R403			
R618	R619			
R137	R237	409H2693	R, CARBON 6.8K 5% 1/4W	4
R634	R513			
R146	R246	409H2695	R, CARBON 8.2K 5% 1/4W	3
R005	R006	409H2697	R, CARBON 10K 5% 1/4W	35
R112	R114			
	R116			

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** RESISTORS **

R134	R164	R167	409H2697	R CARBON 10K 5% 1/4W	35
R170	R173	R176			
R203	R212	R214			
R216	R234	R264			
R267	R270	R273			
R276	R320	R333			
R420	R433	R517			
R601	R609	R610			
R904	R905	R907			
R908	R940				
R115	R215	R313	409H2699	R CARBON 12K 5% 1/4W	13
R326	R338	R339			
R340	R413	R426			
R438	R439	R440			
R604					
R111	R211		409H2700	R CARBON 13K 5% 1/4W	2
R506	R507		409H2701	R CARBON 15K 5% 1/4W	2
R010	R108	R152	409H2703	R CARBON 18K 5% 1/4W	9
R153	R154	R208			
R252	R253	R254			
R306	R322	R406	409H2705	R CARBON 22K 5% 1/4W	5
R422	R936				
R606	R607		409H2707	R CARBON 27K 5% 1/4W	2
R128	R228		409H2709	R CARBON 33K 5% 1/4W	2
R008	R101	R109	409H2713	R CARBON 47K 5% 1/4W	21
R201	R209	R256			
R261	R312	R325			
R329	R412	R425			
R429	R516	R613			
R914	R915	R916			
R917	R918	R924			
R141	R241	R308	409H2717	R CARBON 68K 5% 1/4W	6
R331	R408	R431			
R138	R238	R314	409H2718	R CARBON 75K 5% 1/4W	6
R327	R414	R427			
R315	R341	R415	409H2719	R CARBON 82K 5% 1/4W	4
R441					
R014	R129	R130	409H2721	R CARBON 100K 5% 1/4W	25
R135	R162	R165			
R168	R171	R174			
R229	R230	R235			
R262	R265	R268			
R271	R274	R337			
R437	R602	R612			
R621	R626	R920			
R937					

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** RESISTORS **

R139	R140	R239	409H2725	R CARBON 150K 5% 1/4W	5
R240	R936				
R106	R122	R158	409H2729	R CARBON 220K 5% 1/4W	7
R206	R222	R258			
R605					
R104	R204		409H2731	R CARBON 270K 5% 1/4W	2
R316	R319	R342	409H2733	R CARBON 330K 5% 1/4W	8
R345	R416	R419			
R442	R445				
R317	R318	R334	409H2735	R CARBON 390K 5% 1/4W	10
R343	R344	R417			
R418	R434	R443			
R444					
R615			409H2737	R CARBON 470K 5% 1/4W	1
R117	R119	R136	409H2743	R CARBON 820K 5% 1/4W	6
R217	R219	R236			
R913			409H2745	R CARBON 1.0M 5% 1/4W	1

** CAPACITORS **

C501	C502	C512	42019575	C CERAMIC 500V 0.01UF	4
C513					
C921			4211K421	C CERAMIC 50V 4700PF	1
C914	C915		4211K425	C CERAMIC 50V 0.01UF	2
C107	C207		421C0212	C CERAMIC 50V 820PF	2
C905	C906		42311023	C CERAMIC 50V 12PF	2
C104	C204		423A1047	C CERAMIC 50V 120PF	2
C101	C201	C304	423A1049	C CERAMIC 50V 150PF	4
C404					
C138	C238		423A1053	C CERAMIC 50V 220PF	2
C126	C226		423A2102	C CERAMIC 50V 150PF	2
C911			42910033	C CERAMIC 25V 0.1UF	1
C1			42910036	C CERAMIC 400V 4700	1
C912			42976701	C FILM 50V 1000PF 5%	1
C908	C916		42976713	C FILM 50V 0.01UF 5%	2
C337	C338	C437	42977275	C FILM 63V 0.1UF	4
C438					
C320	C330	C420	42977279	C FILM 63V 0.22UF	4
C456					
C330			4297F721	C FILM 50V 0.047UF 5%	1
C136	C236		42976143	C FILM 100V 820PF	2
C134	C234	C302	42966505	C FILM 50V 2200PF	4

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** CAPACITORS **

C402		42966505	C/FILM 50V 2200PF	4
C308	C310	42966509	C/FILM 50V 4700PF	8
C324	C408			
C423	C424			
C132	C252	42966512	C/FILM 50V 8200PF 5%	2
C110	C137	42966513	C/FILM 50V 0.01UF 5%	8
C237	C306			
C406	C428			
C103	C203	42966514	C/FILM 50V 12000PF 5%	2
C106	C206	42966515	C/FILM 50V 0.015UF 5%	2
C130	C135	42966517	C/FILM 50V 0.022UF 5%	4
C235				
C121	C221	42966518	C/FILM 50V 27000PF 5%	2
C122	C222	42966519	C/FILM 50V 0.033UF 5%	14
C315	C319			
C331	C335			
C415	C419			
C431	C435			
C123	C125	42966520	C/FILM 50V 0.039UF 5%	4
C225				
C124	C224	42966521	C/FILM 50V 0.047UF 5%	5
C414	C430			
C313	C329	42966523	C/FILM 50V 0.068UF 5%	4
C429				
C601		43930023	C/ELEC 16V 47PF	1
C316	C352	43980047	C/ELEC 50V 0.1UF	4
C432				
C139	C239	43993015	C/ELEC 10V 100UF	3
C008	C009	43993016	C/ELEC 10V 220UF	2
C102	C202	43993017	C/ELEC 10V 330UF	2
C510	C511	43993018	C/ELEC 10V 470UF	2
C526		43993021	C/ELEC 10V 3300UF	1
C140	C240	43993024	C/ELEC 16V 10UF	3
C909		43993025	C/ELEC 16V 22UF	1
C503	C504	43993032	C/ELEC 16V 1000UF	2
C514		43993046	C/ELEC 25V 2200UF	1
C521	C522	43993053	C/ELEC 35V 100UF	2
C115	C215	43993059	C/ELEC 50V 0.47UF	3
C425		43993060	C/ELEC 50V 1UF	1
C917	C920	43993061	C/ELEC 50V 2.2UF	2
C902	C903	43993063	C/ELEC 50V 4.7UF	2
C303	C307	43993064	C/ELEC 50V 10UF	2
C520		43993069	C/ELEC 50V 220UF	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
--------	----------	-------------	-----

** CAPACITORS **

C317	C333	C417	43993103	C/ELEC 50V 0.15UF	4
C433					
C904			43993104	C/ELEC 50V 0.22UF	1
C604			439H0014	C/ELEC 16V 10UF	1
C133	C233	C318	439H0047	C/ELEC 50V 0.1UF	7
C334	C418	C434			
C605					
C131	C231		439H0049	C/ELEC 50V 0.22UF	2
C129	C229		439H0053	C/ELEC 50V 1.0UF	2
C117	C217		439J3014	C/ELEC 10V 47UF	2
C001	C002	C003	439J3015	C/ELEC 10V 100UF	11
C004	C006	C007			
C112	C212	C516			
C517	C525				
C005			439J3040	C/ELEC 25V 47UF	1
C505	C506	C515	439J3041	C/ELEC 25V 100UF	8
C518	C519	C523			
C524	C602				
C010	C012	C013	439J3060	C/ELEC 50V 1.0UF	11
C301	C305	C325			
C401	C405	C509			
C527	C603				
C507	C508		439J3063	C/ELEC 50V 4.7UF	2
C011	C105	C109	439J3064	C/ELEC 50V 10UF	33
C111	C113	C114			
C116	C118	C119			
C127	C128	C205			
C209	C211	C213			
C214	C216	C218			
C219	C227	C228			
C311	C312	C322			
C326	C327	C403			
C407	C411	C412			
C422	C426	C427			

MECHANICAL PARTS LIST

Symbol No.	Parts No.	Description	Q'ty	Symbol No.	Parts No.	Description	Q'ty
B103	19605281	Brake rubber	1	B141	19533611	Cassette pressure spring	1
B104	19411121	Half guide E	1	B143	19411141	Cassette lock lever	1
B105	19411111	Half guide B	1	B201	19533701	Lock-on head spring	1
B106	19533651	Head base retaining spring	1	B202	19533671	Head base slide spring	1
B107	19411911	Head support	1	B203	19533661	Pinch roller spring	1
B108	19533451	Pinch roller arm ass'y	1	B204	19534881	Back tension spring	1
B109	19411031	2nd wheel	1	B205	19533691	Idler plate spring	1
B110	19411041	3rd wheel	1	B207	19533861	Cassette support plate	
B111	19410981	Main cam ass'y	1			spring	1
B112	19533541	Idler plate ass'y	1	B209	19533471	Cassette lock lever spring	1
B113	19411051	Felt	1	B210	19534021	Eject lever spring	1
B114	19411082	FR idler ass'y	1	B304		Steel ball ($\phi 2$)	1
B115	19533621	Reel swing ass'y	1	B306		Split washer (2.5 ϕ)	1
B116	19411021	Reel shaft cap	1	B309		Split washer (2 ϕ)	1
B117	19412121	Take-up reel disc ass'y	1	B311		Split washer (1.5 ϕ)	1
B118	19410941	Supply reel disc ass'y	1	B312		Split washer (1.2 ϕ)	1
B119		Spring hook	1	B316		Steel ball (2.5 ϕ)	1
B120	19410921	Sub chassis ass'y	1	B318		Nylon washer	1
B121	19411001	Pinion	1	B401	79751111	Recording/playback combination head	1
B122	19533601	Reel motor pulley	1	B402	79751110	Erase head	1
B123	19534011	Cassette pressure spring	1	PA4	87767601	Cam PWB	1
B124	19411072	REC detection lever	1	B404	79752075	Reel motor	1
B126	19411061	Flywheel adjusting screw	1	B405	79752062	Main motor	1
B127	19533491	Flywheel ass'y	1	B406	65907110	Skeleton motor	1
B128	19605291	Main belt	1	B407	79752064	Mechanism motor	1
B131	19533641	Main motor pulley	1	PA3	87773501	Mechanism control PWB	
B132	19533631	Cam stopper	1			main ass'y	1
B133	19411181	Cassette holder ass'y	1	PA4	87767101	Cam PWB main ass'y	1
B134	19533981	Cassette support plate	1	B409	67910030	Pilot lamp	1
B136	18292031	Damper arm ass'y	1	B410	65907109	Skeleton switch	1
B140	19411101	Cassette nameplate	1				